SWBAT: measure the speed of sound using the wave equation

Jan 4-7:20 AM

Concept Sheet

~ 7 rows when we're done...

We'll fill in two terms (rows) today.

Concept	Meaning	Sym-bol	Units	Picture
PITCH → FREQUENCY	HOW MANY PER UNIT OF TIME FREQ = # / TIME	f, f = 1/T	hertz, Hz = 1/sec	00:01
PERIOD	HOW MUCH TIME FOR ONE. PERIOD = TIME / #	T, T = 1/f	Seconds sec.	TIME
TRANSVERSE: WHEN THE MEDIUM VIBRATES ACROSS THE DIRECTION THE WAVE TRAVELS.				
LONGITUDINAL: WHEN THE MEDIUM VIBRATES ALONG THE DIRECTION THE WAVE TRAVELS.				
INTENSITY → AMPLITUDE	HOW FAR FROM THE MIDDLE.	A	meters m	
WAVELENGTH	HOW FAR FOR ONE "BACK & FORTH"	LAMBDA λ	meters m	
WAVESPEED	DISTANCE OF A WAVE / TIME OF A WAVE, V = λ/T	V, V = λf	meters / second m/s	TIME

Feb 18-6:50 AM

SECA Physics
Monday 11 May 2015

Welcome!!!

H. Leslie Grebe

* Pick up:
  - blue concept sheet
  - slip of paper (for later)

Opening Question:

What are different speeds you can think of?

CARS
PEOPLE
TRAINS
ENGINES

DATA
SPEED
SOUND

Centering

Sep 7-7:04 AM

Speed is change in **distance** over change in **time**

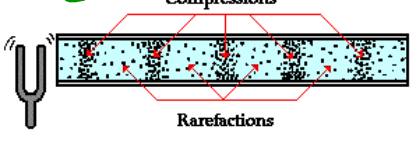
For a wave that's a wavelength / a period

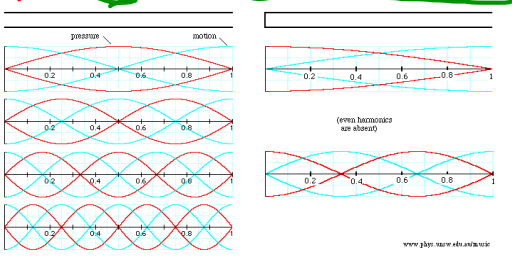
$$V = \frac{\lambda}{T}$$

WAVE EQUATION

And frequency = 1/period so ....

$$f = \frac{1}{T} \qquad V = f \cdot \lambda$$





http://www.acs.psu.edu/drussell/Demos/StandingWaves/StandingWaves.html

Ruben's Tube: 345 Hz & 92 cm

5?? Hz and 40 cm

Feb 27-7:58 AM

What did we see?

f	λ	s
512	64.5 cm (70.5)	33,024 cm/s (36,096)
256	138.5 cm	35,456 cm/s
426.6	80.5 cm	34,341.3 cm/s
341	96.5	32,907
288	118.5	34,128

DOESN'T DEPEND ON FREQ

$35{,}000 \frac{cm}{s} \times \frac{1\ m}{100\ cm} \times \frac{1\ mi}{1609\ m} = 0.2175 \frac{mi}{s}$

$0.2175 \frac{mi}{s} \times \frac{60 \times 60\ s}{1\ hr} \approx 780 \frac{mi}{hr}$

May 12-1:21 PM

Daily 3 Questions

CP: Sound worksheet due Thursday 5/14

* Every day except test/project days
* 3 Questions on the topics of the day
* Main source of daily points
* I am happy to give credit when I have no concerns about someone giving or getting help with the answers.

You can't get your points if you don't have your NAME!!!

Name Period

1.

2.

3.

Sep 9-7:32 AM

1. About how many cm/s is the speed of sound in air?

30-40,000 cm/s

2. To calculate the speed we needed to multiply the wavelength by the ___frequency_____.

3. When we used different frequencies, were the speeds of sound close to each other (in the same ball park)? YES

Apr 25-7:25 AM